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(54) **Method for weaving a carpet and carpet woven with such a method**

(57) This method is for weaving at least one carpet (C1, C2) with a backing fabric (F1, F2) including at least one area (A₁) with piles and at least one area (A₀) without piles. The backing fabric (F1, F2) is woven with, on the one hand, filling warp yarns (f1, f2), binding warp yarns (b1, b'1, b2, b'2) and dead pile yarns (I-VIII) and, on the other hand, weft yarns (Wi, Wo) which are inserted in successive insertion cycles (P1-P20) between the binding warp yarns and comprise inner weft yarns (Wi) inserted on the pile side of the filling warp yarns and outer weft yarns (Wo) inserted on a side of the filling warp yarns opposite to the piles. The warp yarns are organized, along the weft direction, in respective sets with all the

filling warp yarns (f1, f2), binding warp yarns (b1, b'1, b2, b'2) and dead pile yarns (I-VIII) of one set going through a same reed dent space. In at least one area (A₀) without piles of the backing fabric (F1, F2) of a given carpet (C1, C2) and for each warp yarn set, either all the dead pile yarns (I-IV; V-VIII) of said warp yarn set are placed above the inner weft yarns (Wi) or at least two dead piles of said warp yarn set are placed above the inner weft yarns (Wi).
 In the area (A₀) of the carpet (C1, C2) without piles, inner weft yarns (Wi) are alternatively above all the dead pile yarns (I-VIII) of some warp yarn sets or under at least two dead pile yarns of some other warp yarn sets, along the weft direction.

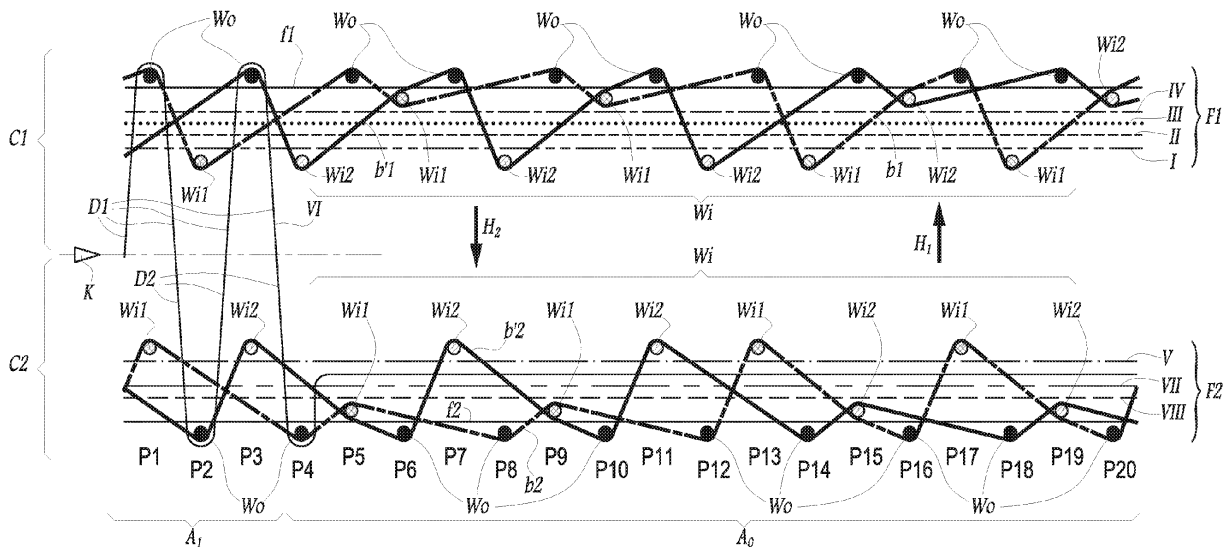


Fig. 1

Description

[0001] This invention belongs to the field of carpet weaving and relates to a method for weaving at least one carpet with a backing fabric including some areas with piles and some areas without piles.

[0002] In the field of carpet weaving, either on face-to-face looms or on looms where only one carpet is woven at a time, it is known to produce carpets where some areas are not provided with piles. In such an area, the weft yarns are visible and one speaks of "weft patterning". Actually, the weft yarns extend on the full width of the carpet but are only visible in areas without piles.

[0003] This type of carpet can be produced on a loom equipped with a weft selector which allows to use special weft threads on the inner side of the backing fabric, that is on its pile side, these special weft threads being visible only in areas without pile patterning. In these areas without pile patterning, the weft effect is obtained thanks to the position of the weft yarns with respect to the filling warp yarns. Since the filling warp yarns are under high tension, the weft yarns are either located above or under the filling warp yarns.

[0004] It is known from EP 1 046 734 to run a carpet weaving method with mixed cut pile and false bouclé. In this method, only warp yarns are patterning.

[0005] The invention aims at giving more freedom to a weaver in order to obtain an optimized weft effect, without substantially increasing the complexity of a weaving loom used to implement the method.

[0006] To this end, the invention relates to a method for weaving at least one carpet, with a backing fabric including at least one area with piles and at least one area without piles where

- the backing fabric is woven with, on the one hand, filling warp yarns, binding warp yarns and dead pile yarns and, on the other hand, weft yarns which are inserted in successive insertion cycles between the binding warp yarns and comprise inner weft yarns inserted on the pile side of the filling warp yarns and outer weft yarns inserted on a side of the filling warp yarns opposite to the piles,
- the warp yarns are organized, along the weft direction, in respective sets with all the filling warp yarns, binding warp yarns and dead pile yarns of one set going through a same reed dent space.

[0007] According to the invention, in at least one area without piles of the backing fabric of a given carpet and for each warp set, either all the dead pile yarns of said warp yarn set are placed under the inner weft yarns or at least two dead pile yarns of said warp yarn set are placed above the inner weft yarns.

[0008] Thanks to the invention, it is possible for the weaver to select, in an area with no pile, zones where the inner weft yarns are visible and zones where they are not visible, along the weft direction. When they are not

visible, the inner weft yarns are covered by some of the dead pile yarns, namely two or more, of the set of warp yarns which belong to the backing fabric. This provides a solution to a weaver who wants to be able to produce different carpets on the width of a loom, with dedicated weft patterning zones, that is zones where a given weft effect is obtained.

[0009] According to advantageous but not compulsory aspects of the invention, which can be taken in any technically admissible configuration, this method incorporates at least one of the following features:

- In said area without piles, all the dead pile yarns of each warp yarn set are selectively placed above or under the inner weft yarns.
- The inner weft yarns are divided into at least two different kinds of inner weft yarns which are alternatively woven into the backing fabric. These different kinds of inner weft yarns can have different colors or different diameters.
- In an area without piles, each binding warp yarn binds, to the outer weft yarns, as many inner weft yarns of each kind.
- In an area without piles, each binding warp yarn extends between two outer weft yarns separated by at least two picks and the binding warp yarn binds one inner weft yarn of each kind to these two outer weft yarns.
- Two backing fabrics are woven face-to-face and at least some piles extend from one backing fabric to the other, in an area with piles of each backing fabric. Alternatively, one backing fabric is woven at a time and at least some piles are obtained from loops going over dummy weft yarns.
- Carpets with different weft effects are woven simultaneously on the width of a weaving loom.

[0010] The invention also relates to a carpet which can be woven with a method as mentioned here-above. More specifically, the invention relates to a carpet with a backing fabric including at least one area with piles and at least one area without piles, where the backing fabric is woven with, on the one hand, filling warp yarns, binding warp yarns and dead pile yarns and, on the other hand, weft yarns inserted between the binding warp yarns and comprising inner weft yarns on the pile side of the filling warp yarns and outer weft yarns on the side of the filling warp yarns opposite to the piles. In an area without piles, the warp yarns are organized, along the weft direction, in identical warp yarn sets comprising filling warp yarns, binding warp yarns and dead pile yarns. According to the invention, in the area without piles, inner weft yarns are alternatively above all the dead pile yarns of some warp yarn sets or under at least two dead pile yarns of some other warp yarn sets, along the weft direction.

[0011] According to further aspects of the invention which are advantageous but not compulsory and which can be taken in any technically admissible combination,

this carpet incorporates at least one of the following features:

- The inner weft yarns are divided into first and second inner weft yarns which alternate along the warp direction.
- The area without piles includes at least a first zone where the first inner weft yarn is visible and the second inner weft yarn is not visible, on the pile side of the fabric, and a second zone where the second inner weft yarn is visible and the first inner weft yarn is not visible, on the pile side of the fabric.
- The width of the first and/or second zones, taken parallel to the weft direction, is variable along the warp direction.
- The carpet includes several first and second zones, at least one first zone being located between two second zones along a direction parallel to the weft direction and between two other second zones along a direction parallel to the warp direction.
- The area with piles includes cut piles, loop piles and/or false bouclé piles.

[0012] The invention will be well understood on the basis of the following description which is given only by way of an example and in connection to the annexed figures:

- figure 1 is a schematic view representing a first weaving method according to the invention,
- figure 2 is a top view, from the pile side, of carpets woven simultaneously on a weaving loom, with the method of figure 1,
- figure 3 is a view similar to figure 1 for a method according to a second embodiment of the invention,
- figure 4 is a view similar to figure 1 for a method according to a third embodiment of the invention,
- figure 5 is a top view, from the pile side, of a carpet woven with the method of figure 4,
- figure 6 is a view similar to figure 1 for a method according to a fourth embodiment of the invention,
- figure 7 is a view similar to figure 1 for a method according to a fifth embodiment of the invention,
- figure 8 is a view similar to figure 1 for a method according to a sixth embodiment of the invention,
- figure 9 is a view similar to figure 1 for a method according to a seventh embodiment of the invention.

[0013] Figure 1 is a schematic cross-section, in the warp direction, of two carpets simultaneously woven one above the other on a face-to-face loom with two non-represented insertion means.

[0014] Picks P1 to P20 are represented on figure 1. Each carpet C1 or C2 includes a backing fabric F1 or F2 and piles D1 or D2 extending from one backing fabric F1 or F2 towards the other backing fabric. Backing fabrics F1 and F2 might also be called ground fabrics. The piles D1 and D2 are supposed to be separated from each other by a knife K belonging to a not further represented cutting

device. Knife K is represented on figure 1 only, but the same kind of cutting device can be used with the other methods of the invention.

[0015] The warp yarns used in this method include binding warp yarns b1 and b'1 and a filling warp yarn f1 used for backing fabric F1. Binding warp yarns b2 and b'2 and filling warp yarn f2 are used for weaving backing fabric F2. One filling warp yarn f1 or f2 is represented in each backing fabric F1 or F2, but several filling warp yarns can be used in each backing fabric.

[0016] The warp yarns also include pile warp yarns which can extend from one backing fabric to the other in order to form the piles D1 and D2, as represented by pile warp yarn VI in a first area A₁ of carpets C1 and C2. Other pile warp yarns I to V, VII and VIII are represented on figure 1 and constitute dead pile yarns which remain in one backing fabric for picks P1 to P20. More precisely, dead pile yarns I to IV remain in backing fabric F1 whereas dead pile yarns V, VII and VIII remain in backing fabric F2 and pile yarn VI remains in backing fabric F2, as a dead pile yarn, as from pick P5. Pile yarns I to VIII are of different colors.

[0017] Along the weft direction of the carpets woven with the method of figure 1, that is along a direction perpendicular to the plane of figure 1, the warp yarns are organized in sets of warp yarns, with all the warp yarns of one set going through the same reed dent space of a reed of the loom. All the warp yarns represented on figure 1, that is binding warp yarns b1, b'1, b2 and b'2, filling warp yarns f1, f2 and pile warp yarns I to VIII belong to the same set of warp yarns.

[0018] In practice, all warp yarn sets are identical, insofar as they include the same yarns.

[0019] A₀ denotes an area of carpets C1 and C2 without piles, that is an area of these two carpets where backing fabrics F1 and F2 are not provided with piles. In area A₀, binding warp yarns b1 and b'1, filling warp yarn f1 and dead pile yarn I to IV belong to backing fabric F1, whereas binding warp yarns b2 and b'2, filling warp yarn f2 and dead pile yarn V to VIII belong to backing fabric F2. This area A₀ is produced between picks P5 to P20.

[0020] Binding warp yarns b1, b'1, b2, b'2 and filling warp yarns f1, f2 are drawn in through heddles which are connected to a shedding device, such as a dobby or a cam motion mechanism. Pile warp yarns I to VIII are fed from a creel and drawn in through heddles which are connected to a three position Jacquard mechanism.

[0021] At each pick P1 to P20, a weft yarn is inserted in each ground fabric F1 and F2 by two non-represented insertion means which travel into two sheds respectively formed by the warp yarns, one above the other. Thus, two weft yarns are inserted into the sheds at each pick. A top shed is defined between warp yarns placed into a top position and a middle position. A bottom shed is defined between warp yarns placed in a middle position and in a bottom position.

[0022] Weft yarns comprise inner weft yarns W_i and outer weft yarns W_o. Inner weft yarns W_i are located, in

each backing fabric F1 or F2, on the same side as the piles D1 or D2 with respect to the filling warp yarns f1 or f2. Outer weft yarns Wo are located, in each backing fabric F1 or F2, opposite the piles D1 and D2 with respect to the filling warp yarns f1 or f2.

[0023] Inner weft yarns Wi are of two different colors respectively identified with references Wi1 and Wi2 on figure 1. Thus, inner weft yarns Wi are divided into first inner weft yarns Wi1 and second inner weft yarns Wi2. As an example, one considers that the first color of inner weft yarns Wi1 is blue, whereas the second color of inner weft yarns Wi2 is red.

[0024] At pick P1, an outer weft yarn Wo is inserted into the top backing fabric F1 and a blue inner weft yarn Wi1 is inserted into the bottom backing fabric F2. At pick P2, an outer weft yarn Wo is inserted into the bottom fabric F2 and a blue inner weft yarn is inserted into the top backing fabric F1. At pick P3, an outer weft yarn is inserted into the top backing fabric F1 and a red inner weft yarn Wi2 is inserted into the bottom ground fabric F2. At pick P4, an outer weft yarn Wo is inserted into the bottom backing fabric F2 and a red inner weft yarn Wi2 is inserted into the top backing fabric F1. Pick P5 is similar to pick P1 for the weft yarns, according to a four pick repeat. In other words, for h between 1 and 16, pick Ph equals Ph+4, in terms of weft insertion.

[0025] A weft selector with at least three channels is used in order to feed the two insertion means with three types of weft yarns, that is the outer weft yarn Wo, which can be jute, and inner weft yarns Wi1 and Wi2 of two different colors.

[0026] As from pick P5 and up to pick P20 at least, the dead pile yarns I to IV, on the one hand, V to VIII, on the other hand, are respectively maintained in the backing fabrics F1 and F2. In other words, no pile yarn is patterning between ground fabrics F1 and F2 as from pick P5.

[0027] For the bottom backing fabric F2 and from pick P5 to pick P6, the dead pile yarns V to VIII are maintained in a middle position by the Jacquard mechanism. At pick P7, these dead pile yarns V to VIII go to the bottom position, so that the inner weft yarn Wi2 is inserted above these dead pile yarns. At picks P8, P9 and P10, the dead pile yarns V to VIII are back into their middle position. At pick P11, they go to the bottom position, as in pick P7.

[0028] Thus, between picks P5 and P12, when seen from the pile side of carpet C2, that is in the direction of arrow H₂ on figure 1, the red inner weft yarns Wi2 inserted at picks P7 and P11 are visible between picks P5 and P11, whereas the blue inner weft yarns Wi1 inserted at picks P5 and P9 are hidden by the dead pile yarns V to VIII. Indeed, the blue inner weft yarns Wi1 are located between filling warp yarn f2 and dead pile yarns V to VIII.

[0029] At pick P12, dead pile yarns V to VIII are back into their middle position. They go back to their bottom position at pick 13, so that the blue inner weft yarn Wi1 is inserted above them. For picks P14 to P16, the dead pile yarns are in their middle position, so that they cover the red inner weft yarn Wi2 inserted at pick P15 which is

hidden from the pile side of carpet C2. The same approach repeats for picks P17 to P20. Thus, between picks P13 and P20, only the blue inner weft yarns Wi1 are visible from the pile side of carpet C2.

5 **[0030]** All the dead pile yarns V to VIII which are incorporated into backing fabric F2 follow the same path or pattern with respect to the inner weft yarns Wi.

[0031] The effect would be substantially the same if only a part of the dead pile yarns of a warp yarn set are placed above the inner weft yarns Wi which are not to be seen from the pile side. At least two dead pile yarns V to VIII are necessary to efficiently hide the inner weft yarn Wi from the pile side.

10 **[0032]** The same applies for carpet C1 where red inner weft yarns Wi2 are visible from the pile side of backing fabric F1, in the direction of arrow H₁, between picks P4 and P12, whereas blue inner weft yarns Wi1 are visible between picks P14 and P20. The non visible inner weft yarns, Wi1 between picks P5 and P12 and Wi2 between picks P13 and P20, are respectively covered by the dead pile yarns I to IV.

20 **[0033]** In this method, two types Wi1 and Wi2 of inner weft yarns Wi are alternatively used in each backing fabric, that is one inner weft yarn of a given type is inserted on every fourth pick since an outer weft yarn is inserted after each inner weft yarn and the two types of inner weft yarns Wi1, Wi2 are used one after the other.

25 **[0034]** In backing fabric F1, the arrangement of the dead pile yarns I to IV with respect to the inner weft yarns Wi1 and Wi2 is selected, along the weft direction, for each set of warp yarns going through a given reed dent space. In backing fabric F2, the arrangement of the dead pile yarns V to VIII with respect to the inner weft yarns Wi1 and Wi2 is selected, along the weft direction, for each set of warp yarns going through a given reed dent space. Those arrangements are variable along the width of a carpet woven with the method of the invention. In other words, the path of the dead pile yarns in each backing fabric F1 and F2 varies from one set of warp yarns to the other, along the weft direction. For a given backing fabric F1 or F2, the inner weft yarns Wi1 and Wi2 are selectively woven above or under all the dead pile yarns, in each warp yarn set.

30 **[0035]** The variation of the dead pile yarns arrangement along the weft direction can be selected warp yarns set by warp yarns set. Several warp yarns sets, adjacent along the weft direction, can have the same arrangement with respect to the inner weft yarns.

35 **[0036]** Thus, as shown on figure 2, it is possible to use a single loom to weave several carpets of different sizes. On figure 2, arrow DA represents the warp direction, that is the direction of the warp yarns, and arrow DE represents the weft direction, that is the direction of the weft yarns. Some areas A₁ with piles of the carpets are represented with crosses X and the areas with no pile are represented with horizontal stripes. In the example of figure 2, carpet C11 is three meters long along direction DA and two meters wide along direction DE, whereas each

of carpets C21 to C24 is one and half meter long and one meter wide. Each carpet has at least one area with piles A_1 and one area without piles A_0 . On figure 2, the light grey zones in areas A_0 represent zones where blue inner weft yarns $Wi1$ are visible from the pile side of a carpet and the dark grey zones represent zones where red inner weft yarns $Wi2$ are visible. At the level of a line L_1 parallel to the weft direction, one notes that blue inner weft yarns are visible in the area A_0 of carpet C11, whereas red inner weft yarns are visible in areas A_0 of carpets C21 and C22. Thus, the patterning weft effect obtained on the two types of carpets woven simultaneously on the same loom can be different, which was not the case with the methods of the prior art.

[0037] In the second embodiment of the invention represented on figure 3, the same elements as in the first embodiment have the same references and are not described in detail. This embodiment involves, amongst others, binding warp yarns $b1$, $b'1$, $b2$, $b'2$, filling warp yarns $f1$, $f2$ and pile warp yarns I to VIII.

[0038] Outer weft yarns Wo are used on the side of the filling warp yarns opposite to the piles D1 and D2 and inner warp yarns Wi of two different colors, $Wi1$ and $Wi2$, are used on the pile side of each backing fabric F1 and F2.

[0039] The weaving machine also includes two insertion means for inserting two weft yarns at each pick. The method makes use of a shedding device which can move the binding and filling warp yarns between two positions and the pile yarn between three positions, as in the first embodiment.

[0040] In this method, binding warp yarn $b1$ binds, to the outer weft yarns Wo , as many blue inner weft yarns $Wi1$ as red inner weft yarns $Wi2$. As shown on figure 3, between picks P1 and P20, binding warp yarn $b1$ binds five inner weft yarns $Wi1$ of the first type, that is blue, to the outer weft yarns Wo . This concerns inner weft yarns $Wi1$ inserted at picks P2, P6, P10, P14 and P18. This same binding warp yarn $b1$ binds, to the outer weft yarns Wo , five inner weft yarns $Wi2$ of the second type, that is red inner weft yarns respectively inserted at picks P4, P8, P12, P16 and P20.

[0041] The same applies for binding warp yarn $b'1$ which binds, to the outer weft yarns Wo , two blue inner weft yarns $Wi1$ of the first type inserted at picks P6 and P14 and two red inner weft yarns $Wi2$ of the second type inserted at picks P8 and P16.

[0042] The same applies for the binding warp yarns $b2$ and $b'2$ of the lower backing fabric F2.

[0043] The fact that each binding warp yarn $b1$, $b'1$, $b2$, $b'2$ binds, to the outer weft yarns Wo , as many first inner weft yarns $Wi1$ and second inner weft yarns $Wi2$ implies that the length of all binding warp yarns is the same on the area A_0 where no pile is created, irrespective of the weft patterning.

[0044] This is important insofar as the required length of the binding yarns depends on whether or not an inner weft yarn is above or under the dead pile yarns and this might have an influence on the total length of the binding

warp yarns which come from the same warp beam. A difference between the weaved length in the binding warp yarns could induce some visible disorder. Since each binding warp yarn binds as many first inner weft yarns $Wi1$ and second inner weft yarns $Wi2$ to the outer weft yarns, this is not the case.

[0045] In the weaving method of figure 3, the binding warp yarns of each ground fabric are divided into two groups which follow an eight pick repeat. The weft yarns follow a four pick repeat.

[0046] In the third embodiment represented on figure 4, the same elements as in the first embodiment have the same references and are not described in detail. In this embodiment, four binding warp yarn $b1$, $b'1$, $b''1$ and $b'''1$ are provided in the upper backing fabric F1 and four binding warp yarns $b2$, $b'2$, $b''2$ and $b'''2$ are provided in the lower backing fabric F2.

[0047] Piles D1 and D2 are created by a pile warp yarn VI in a first area A_1 of the carpets C1 and C2 which correspond to picks P1 to P12. As from pick P13, all piles warp yarns I to VIII are dead pile yarns and are incorporated into the backing fabrics F1 and F2.

[0048] In this embodiment, each binding warp yarn $b1$ to $b'''1$ and $b2$ to $b'''2$ binds the same number of first inner weft yarns $Wi1$ and second inner weft yarns $Wi2$ to the outer weft yarns Wo .

[0049] The binding warp yarns follow a twelve pick repeat and the weft yarns follow a four pick repeat.

[0050] One considers binding warp yarn $b2$ between picks P15 and P27. At picks P15 and P27, binding warp yarn $b2$ goes under outer weft yarns Wo . At pick P16, binding warp yarn $b2$ goes above inner weft yarn $Wi2$. At pick P17, binding warp yarn $b2$ goes above inner weft yarn $Wi1$. From pick P18 to pick P26, binding warp yarn $b2$ does not go above any other inner weft yarn Wi or under any outer weft yarn Wo . Thus, between picks P15 and P27, where it binds two outer weft yarns Wo , binding warp yarn $b2$ goes above two inner weft yarns Wi , that is one weft yarn $Wi1$ of the first type at pick 17 and one weft yarn $Wi2$ of the second type at pick P16.

[0051] The same applies for all binding warp yarns in the area A_0 where no pile is created.

[0052] By a proper programming of the position of areas A_1 and A_0 , it is possible to obtain the configuration of figure 5 where two areas A_1 with piles are formed, along the lateral sides of a carpet C1, and a central area A_0 is formed without piles. In this area, it is possible to create respective zones Z1 where the first inner weft yarns $Wi1$ are visible. These zones Z1 are represented in light grey on figure 5. Other zones Z2 can be created where inner weft yarns $Wi2$ of the second type, e.g. red in our example, are visible. These zones are represented in dark grey on figure 5.

[0053] As shown on figure 5, the width of each zone Z1 or Z2 taken along the weft direction DE can be variable along the warp direction DA. Moreover, several zones Z1 can be located between two zones Z2 in the weft direction DE and between two other zones Z2 in the warp

direction DA. The same applies for zone Z2 which can be located between two zones Z1 in the weft direction and two other zones Z1 in the warp direction.

[0054] In the fourth to sixth embodiments of the invention represented on figures 6 to 8, the invention is implemented with a method where a carpet is woven on a single loom, that is a loom which produces one backing fabric at a time. The same elements as in the first embodiments have the same references and are not described in detail.

[0055] The carpet C2 produced with the method of figure 6 has a backing fabric F2 and loop piles D2 formed by a pile warp yarn VI going over a dummy weft Wd inserted for some picks at the same time as a weft inner yarn Wi or the weft outer yarn Wo.

[0056] At pick P1, an inner weft yarn Wi1 of a first color, for instance blue, is inserted in the backing fabric F2 and a dummy weft Wd is inserted in the top shed. Pile warp yarn VI goes over dummy weft yarn Wd. At pick P2, an outer weft yarn Wo is inserted in the backing fabric F2. At pick P3, an inner weft yarn Wi2 of a second color, red, is inserted in the backing fabric F2 and a dummy weft yarn Wd is inserted into the top shed. At pick P4, an outer weft yarn Wo is inserted in the backing fabric F2. Pick P5 is like pick P1 in terms of weft yarns insertion, according to a four pick repeat.

[0057] A weft selector with at least three channels is required for the insertion mean dedicated to the bottom shed..

[0058] In an area A_1 represented on the left part of figure 6, that is between picks P1 and P4, pile yarn VI is patterning between the backing fabric F2 and the dummy weft yarns Wd which will be removed at a later stage. As from pick P5, binding warp yarns b2 and b'2 filling warp yarn f2 and dead pile yarns V to VIII behave like in the first embodiment. In other words, between picks P5 and P12, only inner weft yarns of the second type Wi2 are visible from the pile side of carpet C2, in the direction of arrow H_2 . Between picks P12 and P20, only inner weft yarns of the first type, namely blue inner weft sides Wi1, are visible.

[0059] In the embodiment of figure 7, each binding warp yarn b2 or b'2 has, in the area A_0 where no pile is created, a path similar to the path of binding warp yarns b2 and b'2 in the second embodiment.

[0060] In the embodiment of figure 8, in the area A_0 where no pile is created, the binding warp yarns b2, b'2, b''2 and b'''2 follow the same path as in the third embodiment.

[0061] The invention can be implemented with a carpet where the piles created in the first area A_1 can be of any type, namely cut pile, loop pile or false bouclé.

[0062] The repartition of zones of different weft patterning represented on figures 2 and 5 can be obtained with all embodiments.

[0063] In the seventh embodiment represented on figure 9, two carpets C1 and C2 are woven face to face and they include each a backing fabric F1 or F2 and piles D1

or D2. This embodiment is close to the third embodiment and one describes here-after only the differences between the third and seventh embodiments. In the seventh embodiment, three different inner weft yarns Wi1, Wi2 and Wi3 are used and they are inserted into the backing fabrics F1 and F2 at successive picks. For example, one can consider that the first inner weft yarn Wi1 is red, the second inner weft yarn Wi2 is blue and the third inner weft yarn Wi3 is green. The first red inner weft yarn Wi1 is inserted, in fabric F1, at picks P4, P10, P16, etc and, in backing fabric F2, at picks P1, P7, P13 etc. Similarly, the second blue inner weft yarn Wi2 is inserted, in backing fabric F1 at picks P5, P11, P17 etc and, in backing fabric F2, at picks P2, P8 P14 etc. Finally, the third green inner weft yarn Wi3 is inserted, in backing fabric F1, at picks P6, P12, P18 etc and, in backing fabric F2, at picks P3, P9, P15 etc.

[0064] Two binding warp yarns are used in each backing fabric, namely b1 and b'1 in backing fabric F1, b2 and b'2 in backing fabric F2.

[0065] One considers binding warp yarn b2 between picks P17 and P29. At picks P17 and P29, binding warp yarn b2 goes under outer weft yarns Wo. At pick P19, binding warp yarn b2 goes above the first inner weft yarn Wi1 which is covered by dead pile yarns V and VI. At pick P20, binding warp yarn b2 goes above the second inner weft yarn Wi2 which is above dead pile yarns V and VI. At pick P21, binding war yarn b2 goes above third inner weft yarn Wi3 which is covered by dead pile yarns V and VI. From pick P22 to pick P29, binding warp yarn b2 does not go above any other inner weft yarn Wi or under any outer weft yarn Wo. Thus, between picks P17 and P29, where it binds two outer weft yarns Wo, binding warp yarn b2 goes successively above three inner weft yarns, that is one inner weft yarn of each type, namely first inner weft yarn Wi1 at pick P19, second inner weft yarn Wi2 at pick P20 and third inner weft yarn Wi3 at pick P21.

[0066] The same applies for all other binding warp yarns b1, b'1 and b'2 in the area A_0 .

[0067] Thus, the embodiment of figure 9 can be considered as an improvement to the embodiment of figure 4 where three kinds of inner weft yarns are used.

[0068] Figure 9 shows only two dead pile yarns I-II in backing fabric F1 and two other dead pile yarns V and VI in backing fabric F2. Actually, the same number of pile yarns can be used as in the other embodiments.

[0069] The invention is not limited by the number of pile yarns of each warp yarns set. Similarly, any number of binding warp yarns can be used.

[0070] According to an alternative embodiment which is not represented, a method with three inner weft yarns can be implemented on a single loom. In other words, the features of the method of figure 9 can be used, for instance, with a method similar to the one of figure 8.

[0071] In all embodiments, the respective width of a weft patterning zone Z1 or Z2 shown on figure 5, along the weft direction, is adapted by the number of weft yarns sets used in this zone. This number can be between one

and one hundred. Similarly, the length of each zone Z1 or Z2 along the warp direction is adjusted by the number of inner weft yarns of a given color visible next to each other. In other words, the pattern between picks P4 and P12 on figure 1 can be repeated along the warp direction in order to place a large number of inner weft yarns of the second type on top of the dead pile yarns, so as to obtain one zone Z2 of a substantive length, e.g. several centimeters.

[0072] The invention is not limited to a weft patterning effect based on inner weft yarns with different colors. Indeed, inner weft yarns with different diameters can also be considered, a particular type of inner weft yarns with different diameters being chenille weft yarns. This can be used instead of inner weft yarns with different colors or in combination with such inner weft yarns.

[0073] The weft selector used to feed the insertion means allows to use different weft yarns according to the needs. In Particular, the number of colors of the weft patterning design is not limited to two colors.

[0074] In all embodiments, all the dead pile yarns of a set of warp yarns are placed under the inner weft yarn which is to be seen in the zones without piles. They all extend between the inner weft yarn and the filling warp yarn. They could also extend on the back of the ground fabric. They could also be divided into a first group which extends between the inner weft yarn and the filling warp yarn and a second group which extends on the back of the ground fabric.

[0075] The technical features of the embodiments and improvements of the invention considered here-above can be combined.

Claims

1. A method for weaving at least one carpet (C1, C2), said carpet having a backing fabric (F1, F2) including at least one area (A₁) with piles (D1, D2) and at least one area (A₀) without piles where:

- the backing fabric is woven with, on the one hand, filling warp yarns (f1, f2), binding warp yarns (b1, b'1, b"1, b""1, b2, b'2, b"2, b""2) and dead pile yarns (I-VIII) and, on the other hand, weft yarns (Wi, Wo) which are inserted in successive insertion cycles (P1-P36) between the binding warp yarns and comprise inner weft yarns (Wi) inserted on the pile side of the filling warp yarns and outer weft yarns (Wo) inserted on a side of the filling warp yarns opposite to the piles,
- the warp yarns are organized, along the weft direction, in respective sets with all the filling warp yarns (f1, f2), binding warp yarns (b1, b'1, b"1, b""1, b2, b'2, b"2, b""2) and dead pile yarns (I-VIII) of one set going through a same reed dent space,

wherein in at least one area (A₀) without piles of the backing fabric (F1, F2) of a given carpet (C1, C2) and for each warp yarn set, either all the dead pile yarns (I-IV; V-VIII) of said warp yarn set are placed under the inner weft yarns (Wi) or at least two dead pile yarns (I-IV; V-VIII) of said warp yarn set are placed above the inner weft yarns (Wi).

2. Method according to claim 1, wherein in said area (A₀) without piles, all the dead pile yarns (I-IV; V-VIII) of each warp yarn set are selectively placed above or under the inner weft yarns (Wi).
3. Method according to one of claims 1 or 2, wherein the inner weft yarns (Wi) are divided into at least two different kinds of inner weft yarns (Wi1, Wi2, Wi3) which are alternatively woven into the backing fabric (F1, F2).
4. Method according to claim 3, wherein the inner weft yarns (Wi1, Wi2, Wi3) of the different kinds have different colors.
5. Method according to any one of claims 3 or 4, wherein in an area (A₀) without piles, each binding warp yarn (b1, b'1, b"1, b""1, b2, b'2, b"2, b""2) binds to the outer weft yarns (Wo) as many inner weft yarns (Wi1, Wi2, Wi3) of each kind.
6. Method according to claim 5, wherein in an area (A₀) without piles, each binding warp yarn (b1, b'1, b"1, b""1, b2, b'2, b"2, b""2) extends between two outer weft yarns (Wo) separated by at least two picks and the binding warp yarn binds one inner weft yarn (Wi1, Wi2, Wi3) of each kind to these two outer weft yarns (Wo).
7. Method according to any preceding claims, wherein two backing fabrics (F1, F2) are woven face to face and at least some piles (D1, D2) extend from one backing fabric to the other, in an area (A₁) with piles of each backing fabric.
8. Method according to any one of claims 1 to 6, wherein in one backing fabric (F2) is woven at a time and at least some piles (D2) are obtained from loops going over dummy weft yarns (Wd).
9. Method according to any preceding claims, wherein carpets (C11, C21-C24) with different weft effects (Z1, Z2) are woven simultaneously on the width of a weaving loom.
10. A carpet (C1, C2, C11, C21-C24) with a backing fabric (F1, F2) including at least one area (A₁) with piles and at least one area (A₀) without piles, where the backing fabric is woven with, on the one hand, filling warp yarns (f1, f2), binding warp yarns (b1, b'1, b"1,

b^{'''1}, b², b^{'2}, b^{''2}, b^{'''2}) and dead pile yarns (I-VIII) and, on the other hand, weft yarns (Wi, Wo) inserted between the binding warp yarns and comprising inner weft yarns (Wi) on the pile side of the filling warp yarns and outer weft yarns (Wo) on the side of the filling warp yarns opposite to the piles,, the warp yarns being organized, in an area (A₀) without piles and along the weft direction, in identical warp yarn sets comprising filling warp yarns (f1, f2), binding warp yarns (b1, b^{'1}, b^{''1}, b^{'''1}, b², b^{'2}, b^{''2}, b^{'''2}) and dead pile yarns (I-VIII), wherein, in said area (A₀) without piles, inner weft yarns (Wi) are alternatively above all the dead pile yarns (I-VIII) of some warp yarn sets or under at least two dead pile yarns of some other warp yarn sets, along the weft direction (DE).

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11. Carpet according to claim 10, wherein the inner weft yarns (Wi) are divided into first and second inner weft yarns (Wi1, Wi2) which alternate along the warp direction (DA).
 12. Carpet according to claim 11, wherein the area without piles includes at least a first zone (Z1) where the first inner weft yarn (Wi1) is visible and the second inner weft yarn (Wi2) is not visible, on the pile side of the fabric, and a second zone (Z2) where the second inner weft yarn (Wi2) is visible and the first inner weft yarn (Wi1) is not visible, on the pile side of the fabric.
 13. Carpet according to claim 12, wherein the width of the first and/or second zones (Z1, Z2), taken parallel to the weft direction (DE), is variable along the warp direction (DA).
 14. Carpet according to any one of claims 12 and 13, wherein it includes several first and second zones (Z1, Z), at least one first zone (Z1) being located between two second zones (Z2) along a direction parallel to the weft direction (DE) and between two other second zones (Z2) along a direction parallel to the warp direction (DA).
 15. Carpet according to any one of claims 10 to 14, wherein the area with piles (A₁) includes cut piles, loop piles and/or false bouclé piles.

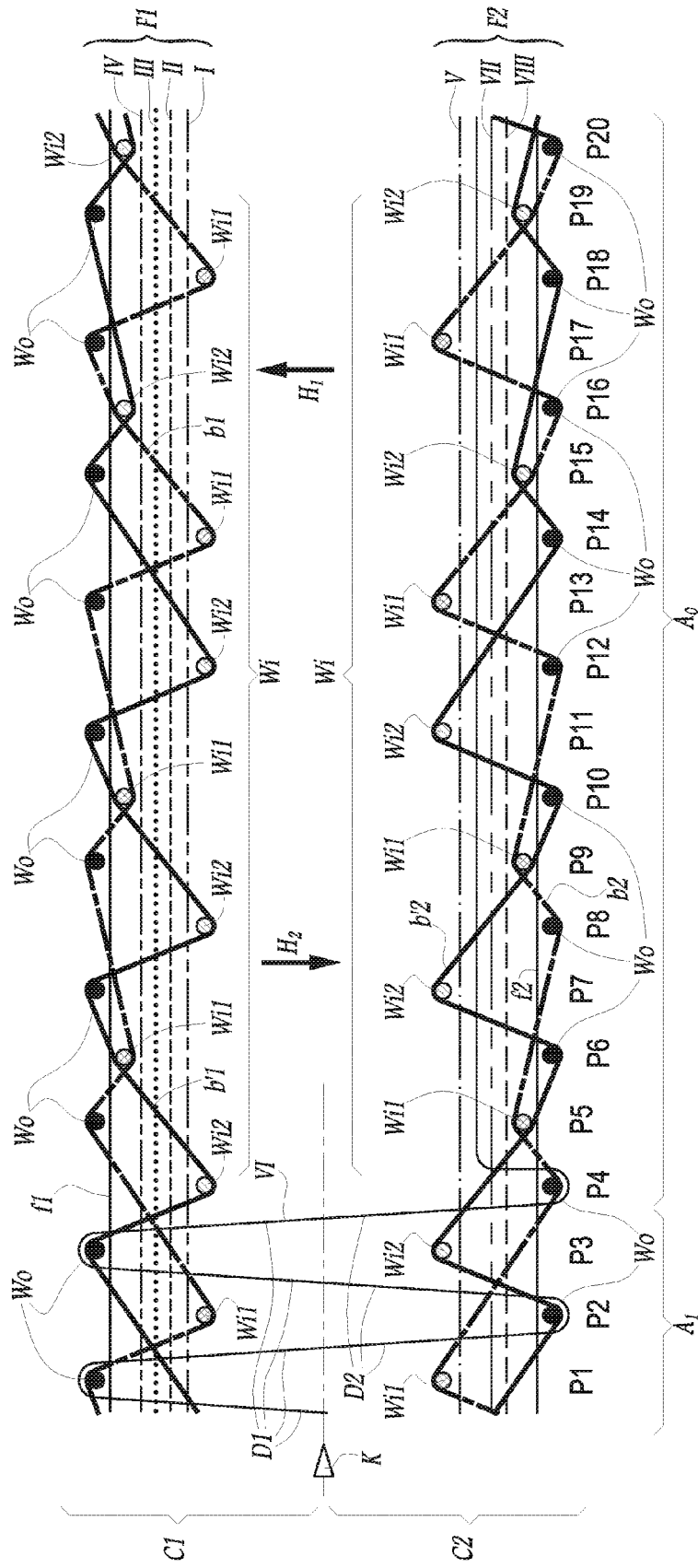
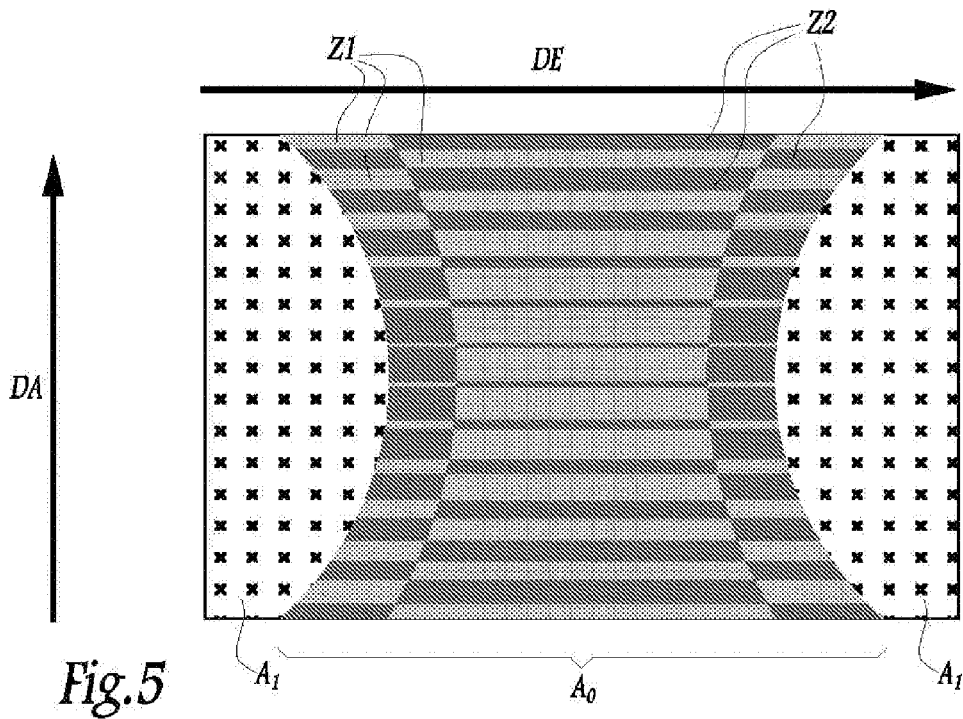
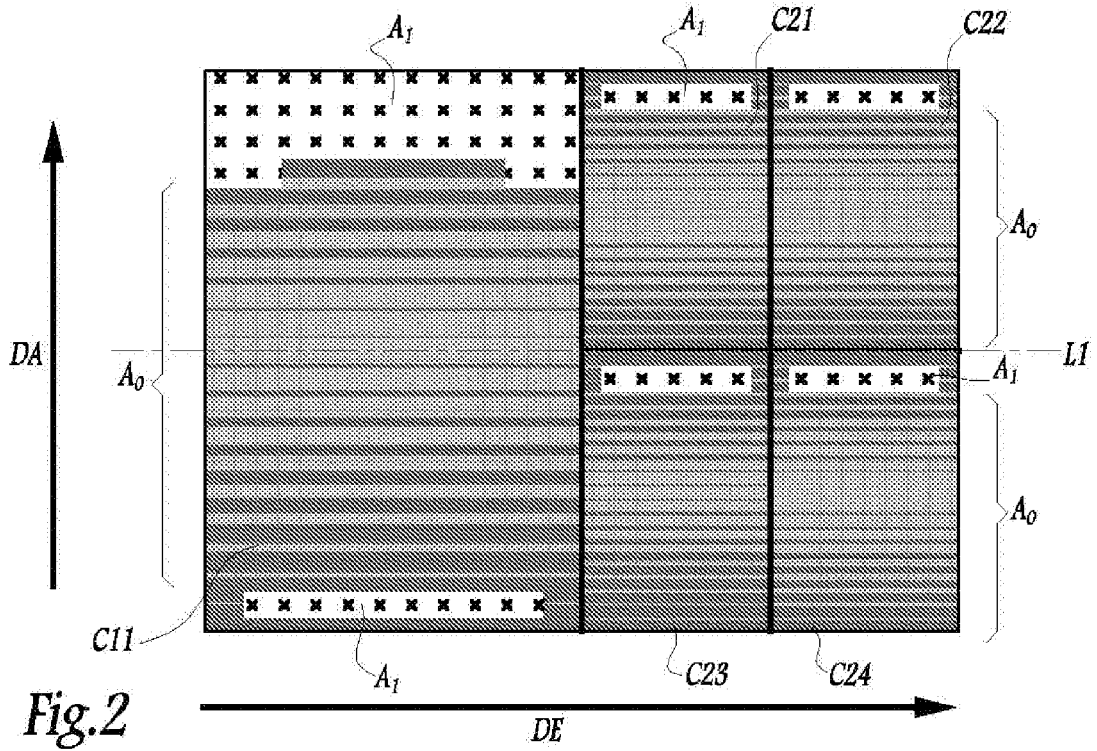


Fig. 1



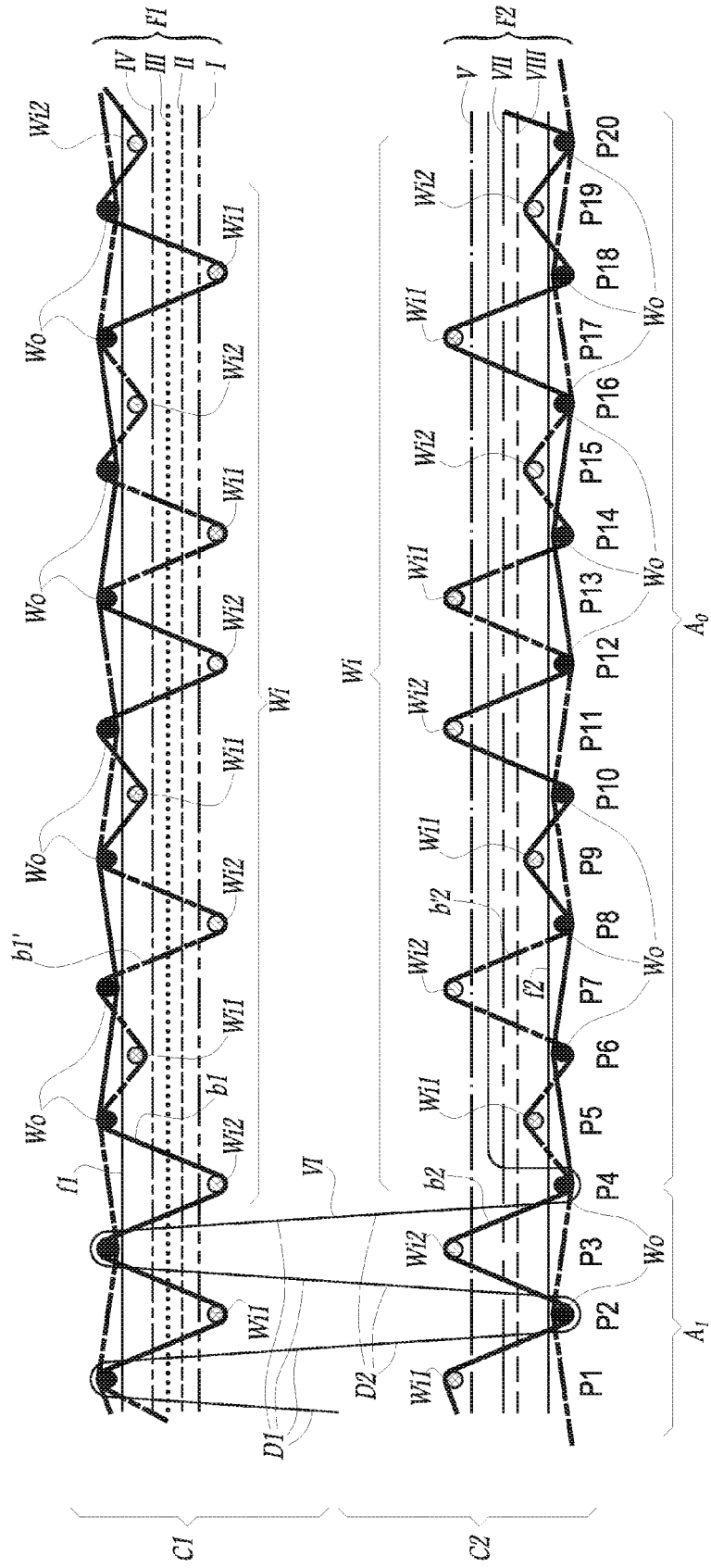


Fig.3

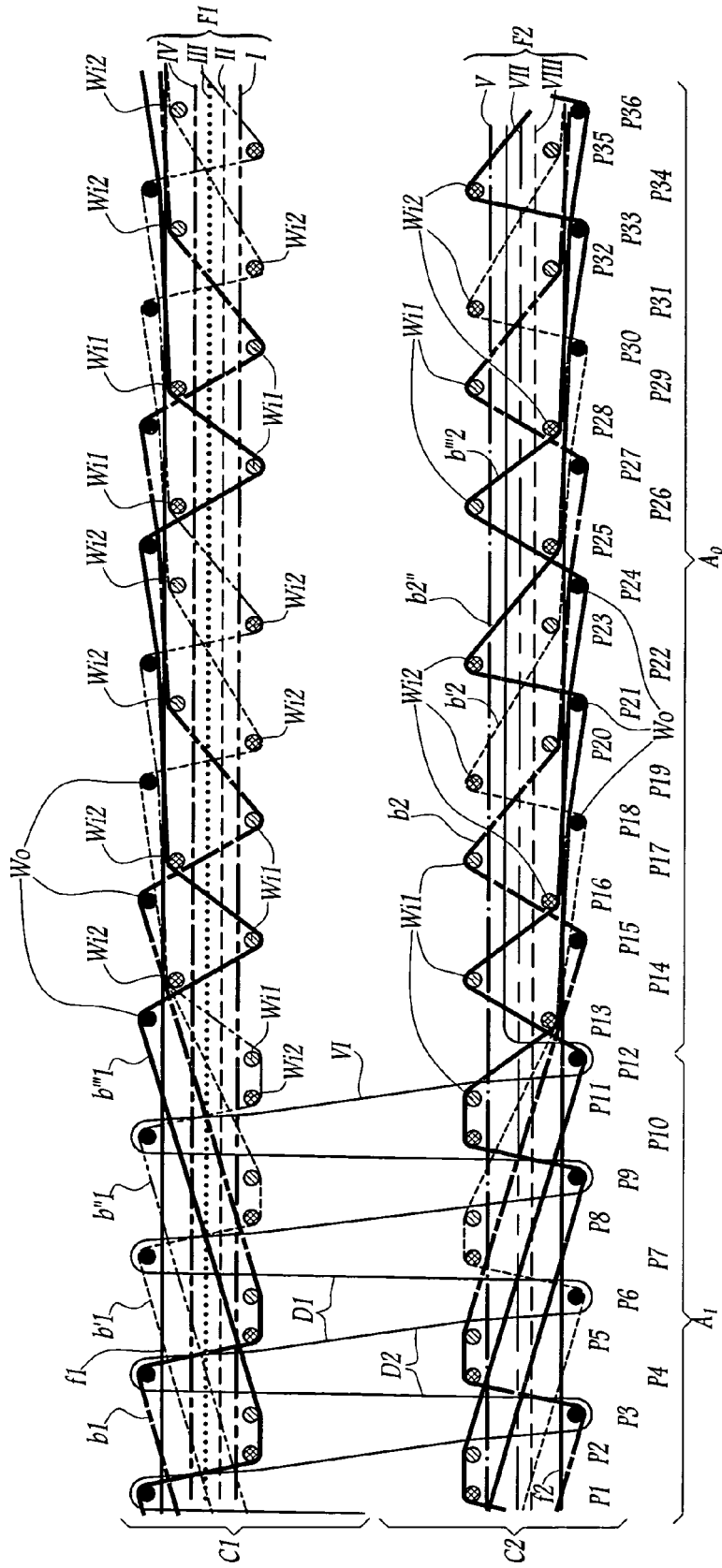


Fig. 4

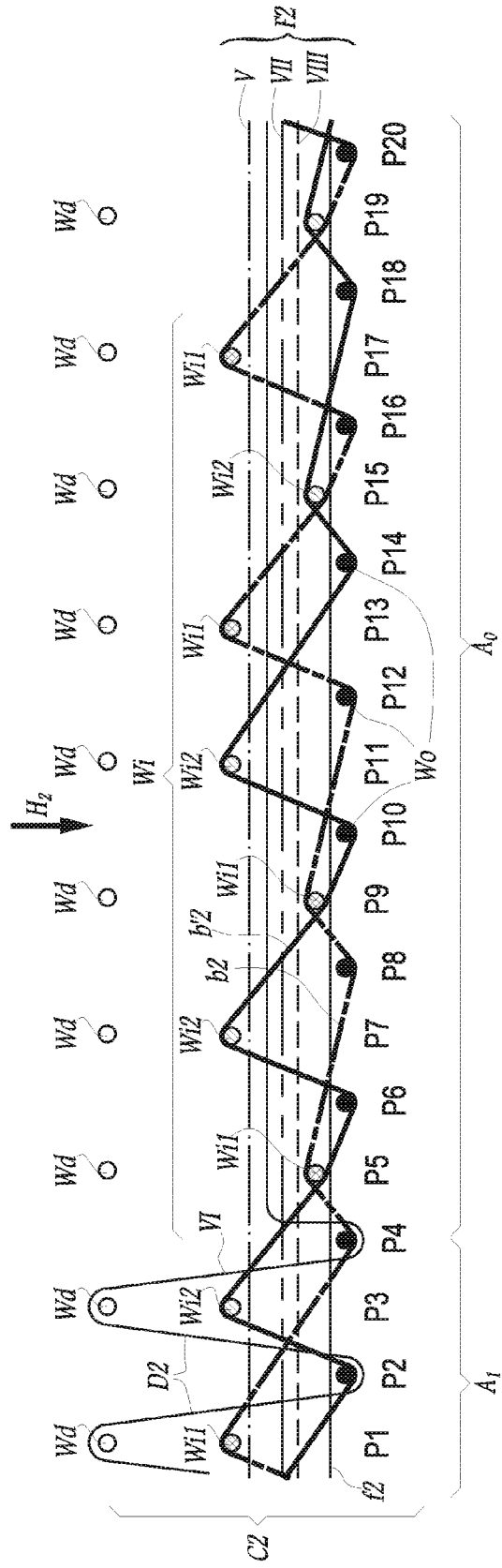


Fig.6

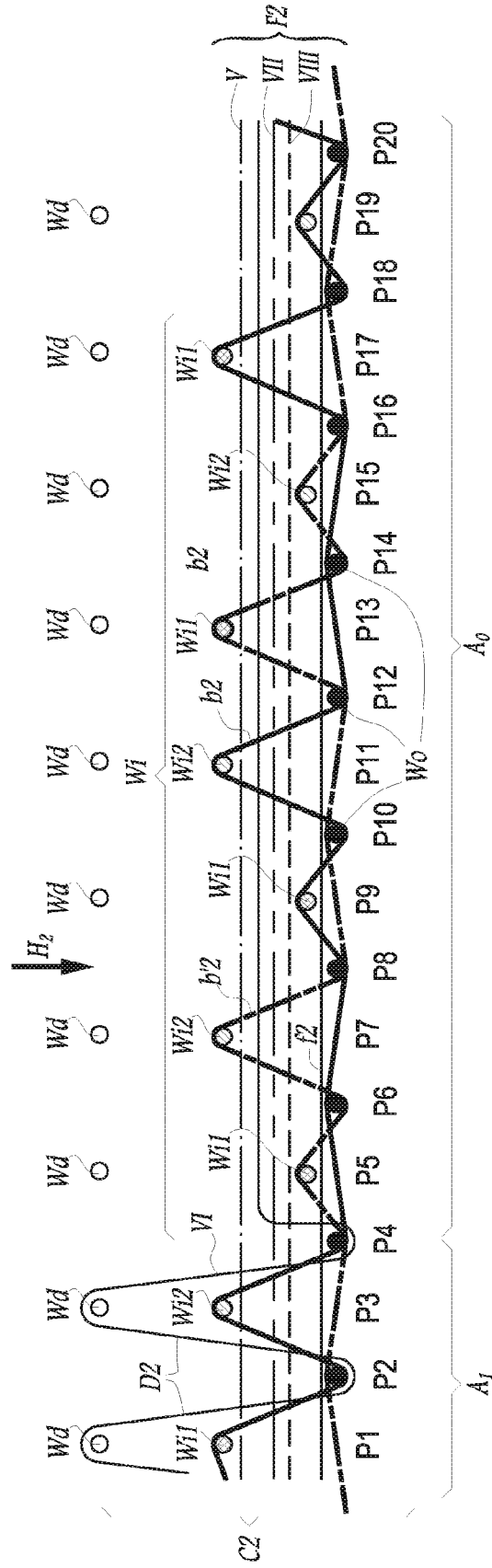


Fig.7

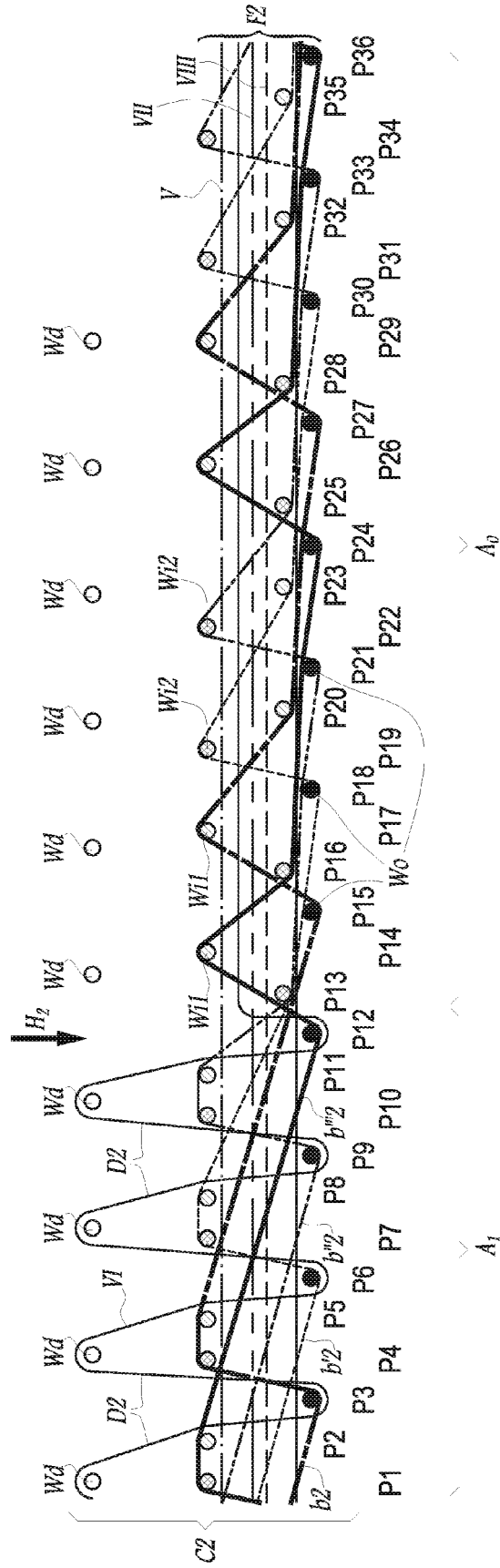


Fig.8

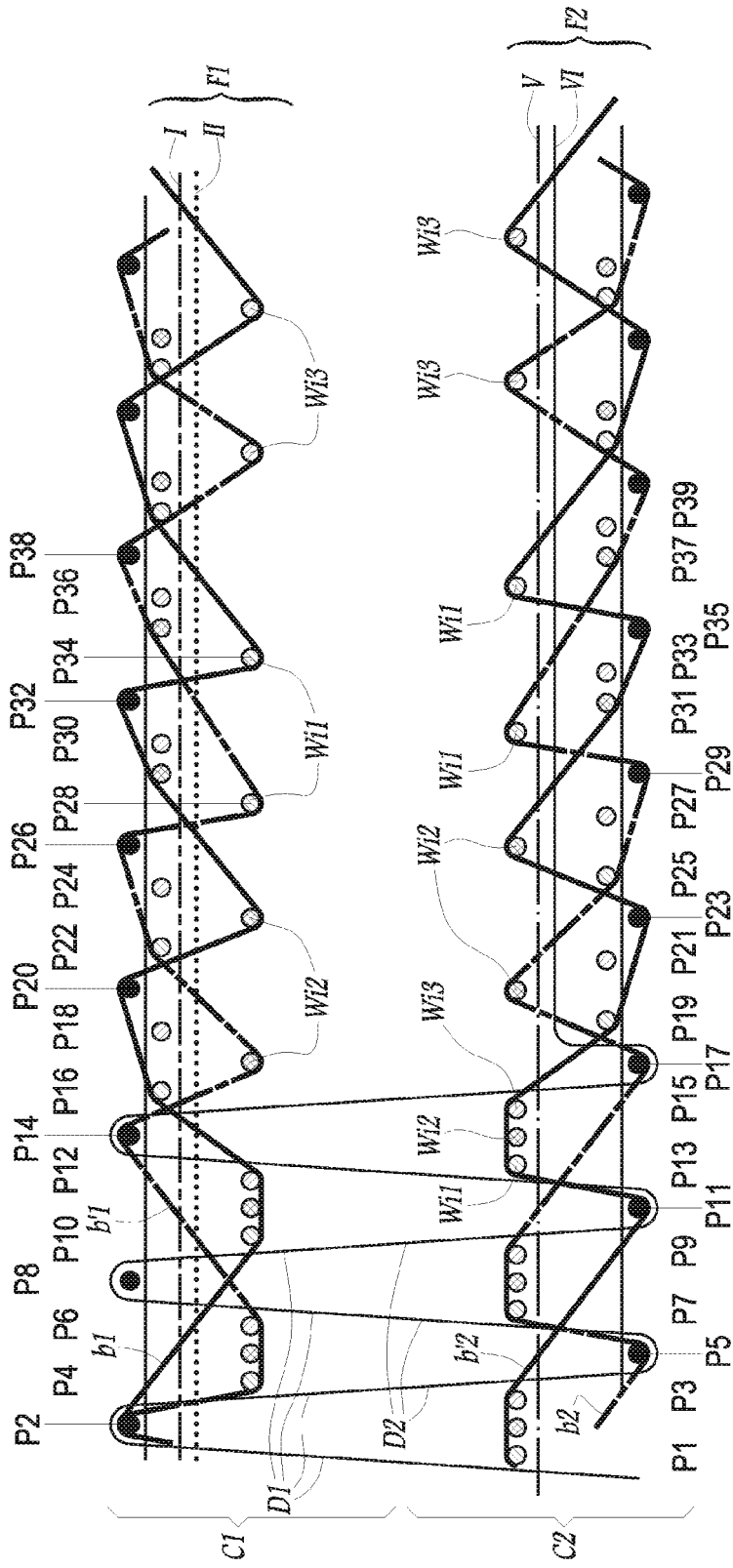


Fig.9



EUROPEAN SEARCH REPORT

Application Number
EP 11 30 6105

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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			TECHNICAL FIELDS SEARCHED (IPC)
			D03D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 22 March 2012	Examiner Louter, Petrus
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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22-03-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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